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**A rail skate**

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ABSTRACT

A rail skate (10) provides a moveable anchor point on a rail (15) for a safety harness (30). The rail skate (10) comprises two pivoted jaws (11, 12) which are able to be closed around the head of the rail (15). The jaws (11, 12) are locked in their closed configuration by pins (27) passing through registered apertures (26) in the jaws (11, 12). The rail skate is provided with wheels (21) which ride on top of the rail (15), as well as wheels (18) which roll along the underside of the rail head. The safety harness (30) can be connected by a safety rope (31) to a connection bar (24, 25) on the rail skate. The rail skate enables a person wearing the harness to travel along the rail line (15) but the safety rope (31) limits movement transversely to the rail line.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A releasable rail connector adapted, in use, to anchor a safety line of a harness worn by an operator to a rail, the rail connector having

5 a pair of pivotally-connected jaw members able to be releasably closed around the head of the rail, and means for locking the jaw members in their closed configuration,

10 whereby in its closed configuration, the rail connector is slidable along the rail but not removeable from the rail intermediate its ends.

2. A rail connector as claimed in claim 1, wherein each jaw member has at least one aperture therein, the apertures in respective jaw members being aligned when  
15 the jaw members are in their closed configuration, the locking means comprising at least one pin insertible in the aligned apertures to lock the jaw members in their closed configuration.

3. A rail connector as claimed in claim 2, further  
20 having a handle connected to the locking pin(s) for retracting the locking pin(s) from the aligned apertures.

4. A rail connector as claimed in claim 2 or 3, wherein each locking pin is biased toward insertion in the aligned apertures.

25 5. A rail connector as claimed in any preceding claim, further having at least one roller member adapted to run along the top of the rail in use.

6. A rail connector as claimed in claim 5, further having at least one additional roller located on each  
30 side of the rail, and adapted to engage under the head of the rail in use.

7. A rail connector as claimed in claim 5 or 6 wherein the rollers are adjustably mounted on the connector.

35 8. A rail connector as claimed in any preceding claim, wherein each jaw member is generally U-shaped, and has two C-shaped side arms or plates joined by a web member.

9. A rail connector as claimed in any preceding claim further comprising an anchor portion to which the safety line is connectible.

10. Safety apparatus for use with rail lines,  
5 comprising

a safety harness adapted to be worn by an operator,

a rail skate releasably mounted to the rail line, the rail skate being moveable along the rail line  
10 but not removeable from the rail line intermediate its ends when the skate is mounted to the line, and

a flexible line connected between the rail skate and the harness.

11. A releasable rail connector substantially as  
15 hereinbefore described with reference to the accompanying drawings.

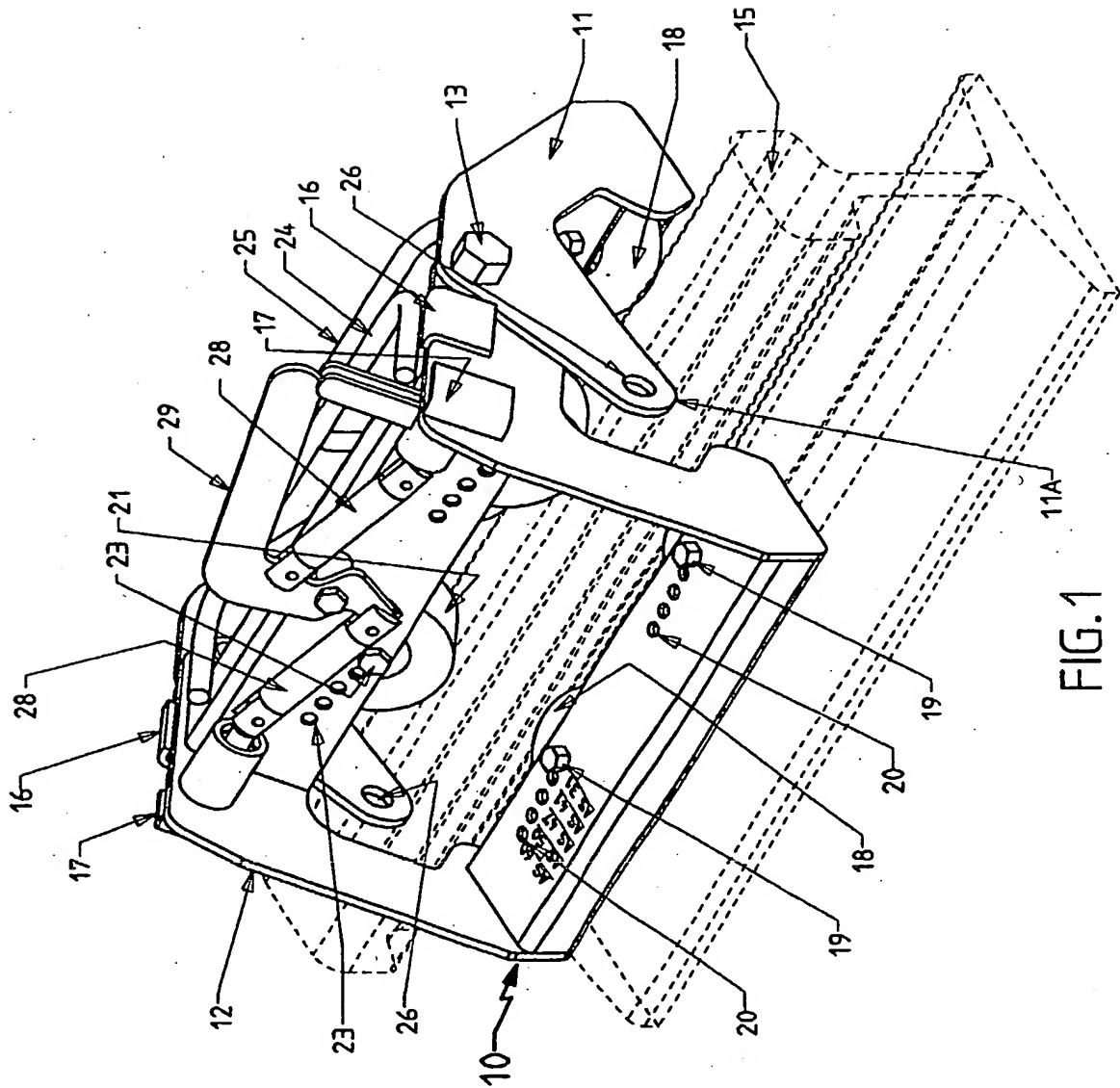
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By their Patent Attorneys

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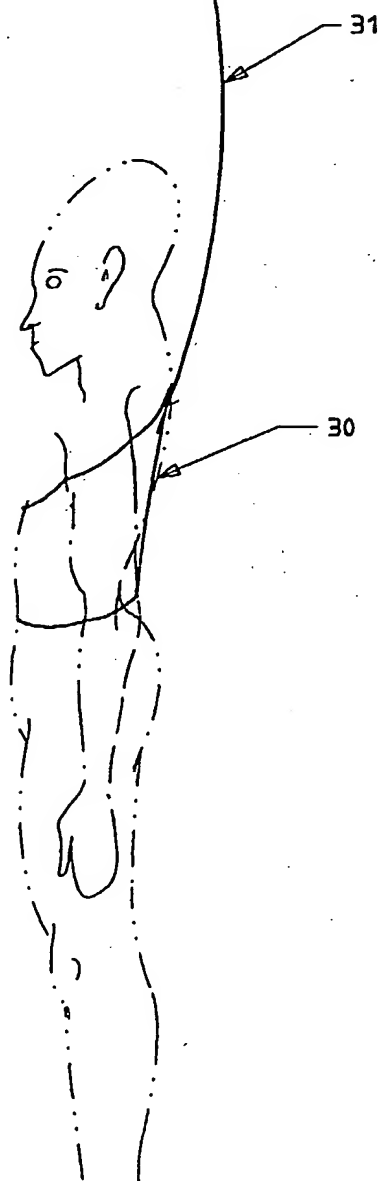
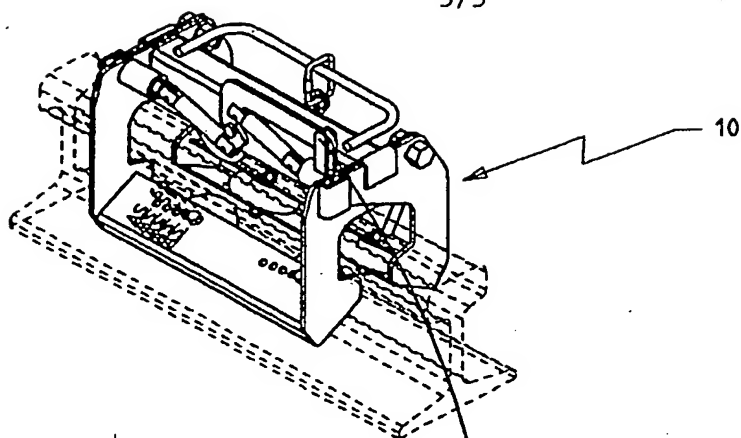


FIG.5

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COMPLETE SPECIFICATION  
FOR A STANDARD PATENT

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Invention Title: A RAIL SKATE

The following statement is a full description of this invention, including the best method of performing it known to us:

THIS INVENTION relates to a safety attachment for rail lines. In particular, the invention is directed to a rail skate which enables an operator to work freely along and around a rail line on a bridge, yet arrests the fall of the operator in the event of an accidental fall.

#### BACKGROUND ART

Railway lines need to be checked regularly for wear and damage. Such lines often cross elevated bridges. Since railway bridges are not normally designed for pedestrian traffic and rarely have safety rails, line inspectors working on bridged face the risk of falling from the railway bridges. Even though care is taken by the inspectors, accidents inevitably happen. Such accidents can have serious consequences, as falls are often fatal.

It is known to use safety harnesses when working in elevated positions. The harnesses are designed to be connected by a safety line to a fixed point. Such safety harnesses are not particularly suitable for line inspectors however, as their fixed anchoring severely restricts the operating range of inspectors.

It is an object of the present invention to provide an improved safety device for operators working around elevated rail lines.

#### SUMMARY OF THE INVENTION

In one form, this invention provides a releasable rail connector adapted, in use, to anchor a safety line of a harness worn by an operator to a rail, the rail connector having

a pair of pivotally-connected jaw members able to be releasably closed around the head of the rail, and means for locking the jaw members in their closed configuration,

whereby in its closed configuration, the rail connector is slidable along the rail but not removeable from the rail intermediate its ends.

Typically, the rail connector is in the form of a skate having rollers, such as small wheels, which run along the rail. Preferably, three sets of roller wheels are provided on the skate, one set rolling on the top of the rail, and the other (lower) two sets of wheels being located on opposite sides of the rail and engaging the rail under the head.

In the preferred embodiment, the jaw members are each generally U-shaped, with C-shaped arms connected by a web. The jaws can be manually closed around the head of the rail. The two lower sets of wheels are suitably mounted on the webs of the respective jaws.

The locking means suitably comprises locking pins which locate in apertures in the arms of the two jaws which register when the jaws are in the closed position. Preferably, the locking pins are spring biased to locate in the apertures, and prevent the jaws from opening inadvertently. The locking pins are connected to a release handle which, when rotated, retracts the locking pins from the registered apertures of the closed jaws, enabling the jaws to be manually opened and removed from the rail.

The rail skate provides a freely moveable anchor point for the safety rope of a harness. This allows line inspectors to travel freely along the rail, yet the safety rope limits movement transversely to the rail, e.g. arresting a fall from a rail bridge.

In order that the invention may be more fully understood and put into practice, a preferred embodiment thereof will now be described with reference to the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a rail skate according to one embodiment of the invention, in an open configuration;

Fig. 2 is a perspective view of the rail skate of Fig. 1, in a closed configuration;

Fig. 3 is an end elevation of the rail skate of Fig. 2;

Fig. 4 is a side elevation of the rail skate of Fig. 2; and

5 Fig. 5 is a perspective view showing use of the rail skate as a safety device.

#### DESCRIPTION OF PREFERRED EMBODIMENT

As shown in Figs. 1-4, a rail skate 10 comprises two jaws 11, 12 which are pivotally connected to each other by bolts 13, 14 (or any other suitable pin-type connectors). The jaws 11, 12 are each generally U-shaped, with C-shaped side arms or plates connected by a web. The ends of the side arms of one jaw are pin-jointed intermediate the ends of respective side arms of the other jaw.

The jaws 11, 12 are able to open and close about a pivot axis defined by the connectors 13, 14. Catches 16 provided on jaw 12 limit the closing movement of the jaw 11 relative to jaw 12. In the fully closed position, the end portions 11A of the side arms of jaw 11 locate in respective shielded recesses defined by cover flanges 17 on the side arms of jaws 12.

The web portion of each U-shaped jaw 11, 12 is provided with a pair of wheels 18, such that when the skate is closed around the head of a rail 15, the wheels 18 bear on the undercut portion of the rail line head as shown more clearly in Fig. 3.

The wheels 18 rotate about axle pins which are typically formed by bolts 19 located in apertures 20 on the respective jaws. Advantageously, a series of apertures is provided for each wheel to allow variable positioning of the wheels 18 relative to the jaws 11, 12. This enables the rail skate to be used on rail lines of different sizes and configurations.

A further pair of wheels 21 is mounted on a cross member 32 extending between side arms of jaw 12. The wheels 21 bear upon the top side of the rail line 15,

as shown more clearly in Fig. 3. Again, the wheels 21 rotate about axle pins 22 which are removably inserted in apertures 23 in cross member 32. Several apertures 23 are provided for each wheel to allow variable positioning of the wheels 21 to accommodate different rail sections.

In use, the rail skate serves as an anchor for a safety rope connected to a harness worn by an operator, such as a line inspector. Connection rods 24, 25 are suitably provided on the rail skate to provide easy connection or anchor points for the safety rope 31, as shown in Fig. 5.

An aperture 26 is provided in the end 11A of each side arm or plate of jaw 11, as shown in Fig. 1. A similar aperture (hidden) is provided on each side arm of jaw 12 behind the cover flange 17. When the jaws 11, 12 are fully closed, the side arms of jaw 11 are received within catches 16 and 17, and the apertures 26 in jaw plates 11 and 12 align. Spring-loaded pins 27 locate in the registered apertures 26, thereby locking the jaws 11, 12 in their closed configuration.

The pins 27 are connected by respective arms 28 to a release handle 29 pivotally mounted on cross member 32. By rotating the release handle (anti-clockwise in Fig. 4), the pins 27 are retracted from the apertures 26, thereby allowing the jaws to be opened.

In use, the jaws 11, 12 are opened and the rail skate is placed on top of the rail 15. (The positions of the wheels 18, 21 are suitably adjusted prior to use to suit the particular rail line on which the skate is to be used).

The jaws are then simply closed manually around the head of the rail. (The release handle 29 is raised to retract the locking pins 27 and thereby permit the jaws to be fully closed around the rail head). With the jaws 11, 12 closed around the head, and the apertures 26 registered with the locking pins 27, the handle 29 is depressed to permit the locking pins 27 to engage the apertures, and securely lock the jaws in their closed

configuration about the head of the rail.

Alternatively, the locking pins 27 may have a chamfered edge like latch tongues, such that the jaws can be pushed closed against the spring bias of the locking pins. The ends of jaw plates 11 deflect the pins as the jaws close, before the pins snap back into the apertures 26 under their spring bias.

After the skate 10 has been mounted to the rail line 15, it is able to travel freely along the line, yet cannot be removed from the rail intermediate its ends. The safety rope 31 of an operator's harness 30 is connected to either connection rod 24, 25. As the operator moves along the rail line in the course of inspection, the skate 10 is able to freely follow the operator. However, in the event that the operator falls from a rail bridge, the fall will be arrested by the safety rope 31.

The rail skate provides a simple yet secure means of anchoring a safety line, while enabling a line inspector to travel freely along the line. The rail skate can be removed from the line in a simple one-handed lever action.

The foregoing describes only one embodiment of the invention, and modifications which are obvious to those skilled in the art may be made thereto without departing from the scope of the invention.

For example, although the rail skate has been described with reference to its use in rail line inspection, it can also be used by other persons working in elevated positions, such as riggers and painters. Moreover, the rail line to which the skate is attached may be an overhead rail, or a side rail.

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  - 5 a pair of pivotally-connected jaw members able to be releasably closed around the head of the rail, and means for locking the jaw members in their closed configuration,  
whereby in its closed configuration, the rail
  - 10 connector is slidable along the rail but not removeable from the rail intermediate its ends.
2. A rail connector as claimed in claim 1, wherein each jaw member has at least one aperture therein, the apertures in respective jaw members being aligned when
  - 15 the jaw members are in their closed configuration, the locking means comprising at least one pin insertible in the aligned apertures to lock the jaw members in their closed configuration.
3. A rail connector as claimed in claim 2, further
  - 20 having a handle connected to the locking pin(s) for retracting the locking pin(s) from the aligned apertures.
4. A rail connector as claimed in claim 2 or 3, wherein each locking pin is biased toward insertion in the aligned apertures.
5. A rail connector as claimed in any preceding claim, further having at least one roller member adapted to run along the top of the rail in use.
6. A rail connector as claimed in claim 5, further having at least one additional roller located on each
  - 30 side of the rail, and adapted to engage under the head of the rail in use.
7. A rail connector as claimed in claim 5 or 6 wherein the rollers are adjustably mounted on the connector.
8. A rail connector as claimed in any preceding
  - 35 claim, wherein each jaw member is generally U-shaped, and has two C-shaped side arms or plates joined by a web member.

9. A rail connector as claimed in any preceding claim further comprising an anchor portion to which the safety line is connectible.

10. Safety apparatus for use with rail lines,  
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10 ends when the skate is mounted to the line, and

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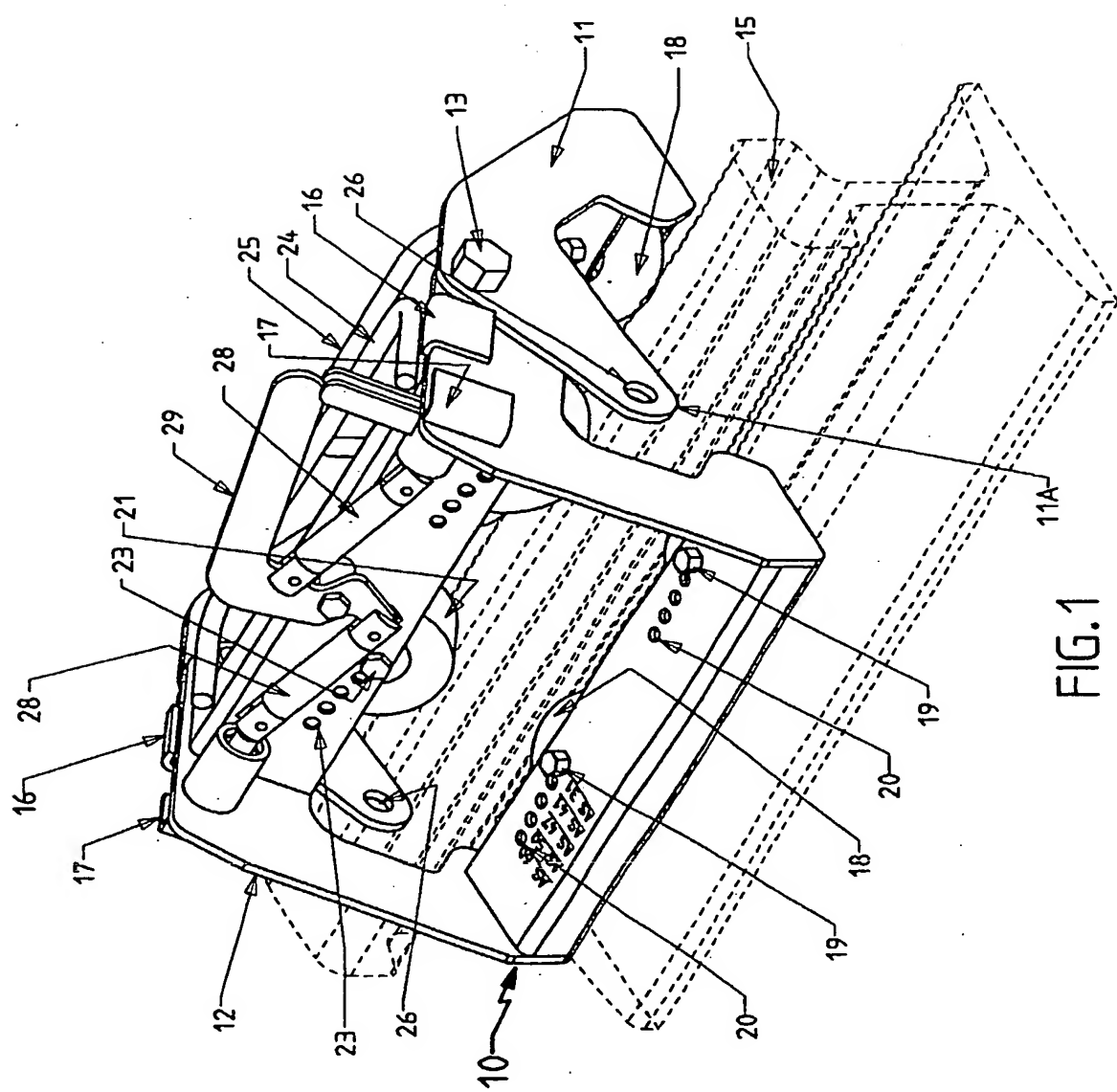


FIG.1

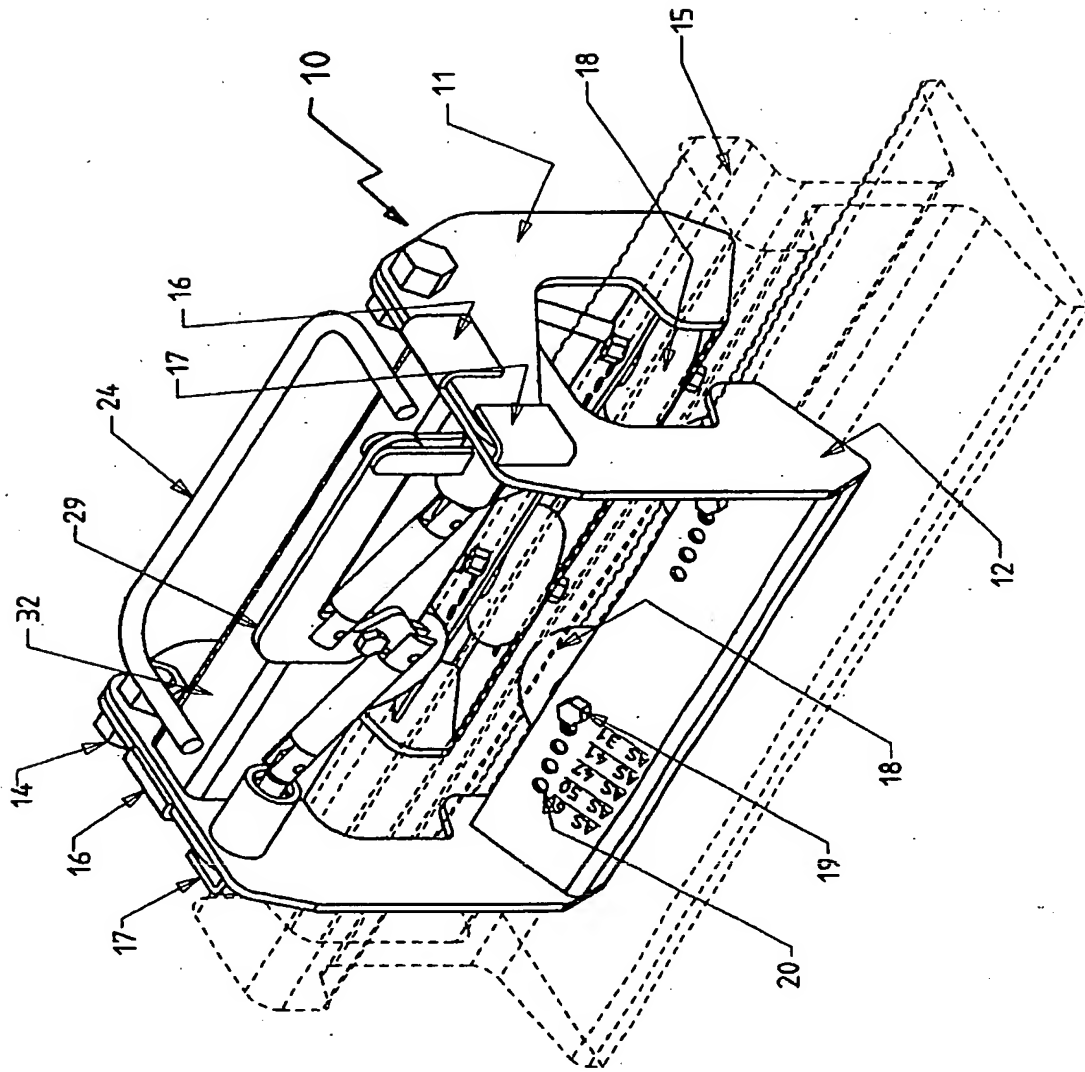


FIG. 2

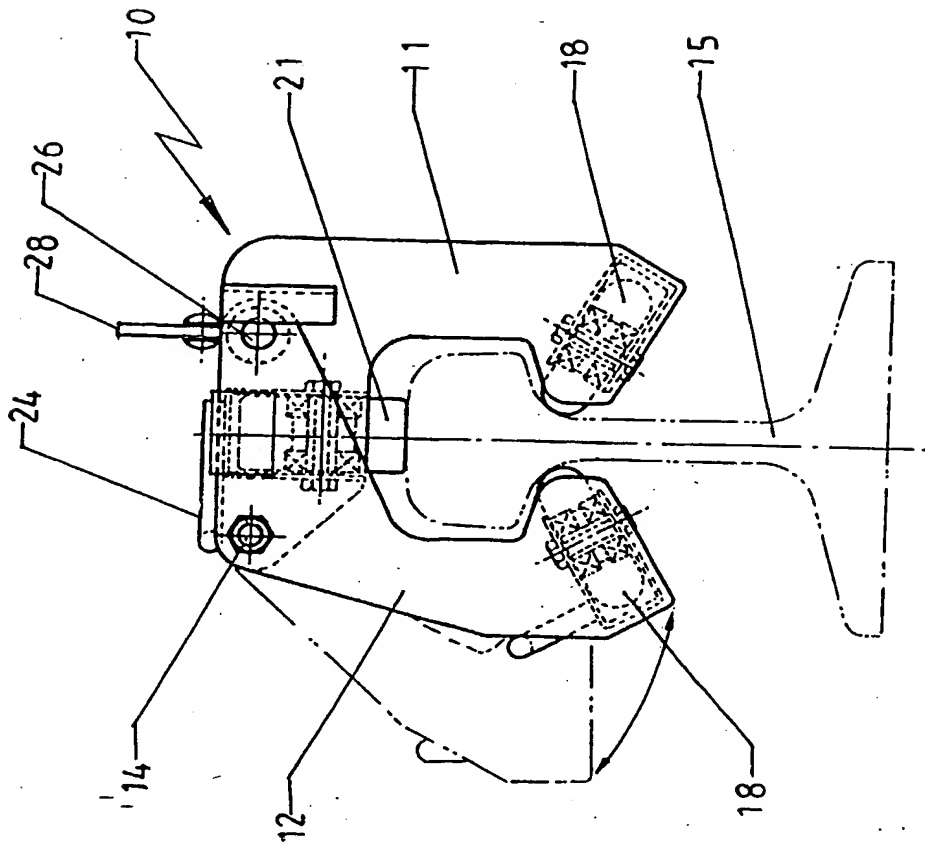


FIG. 3

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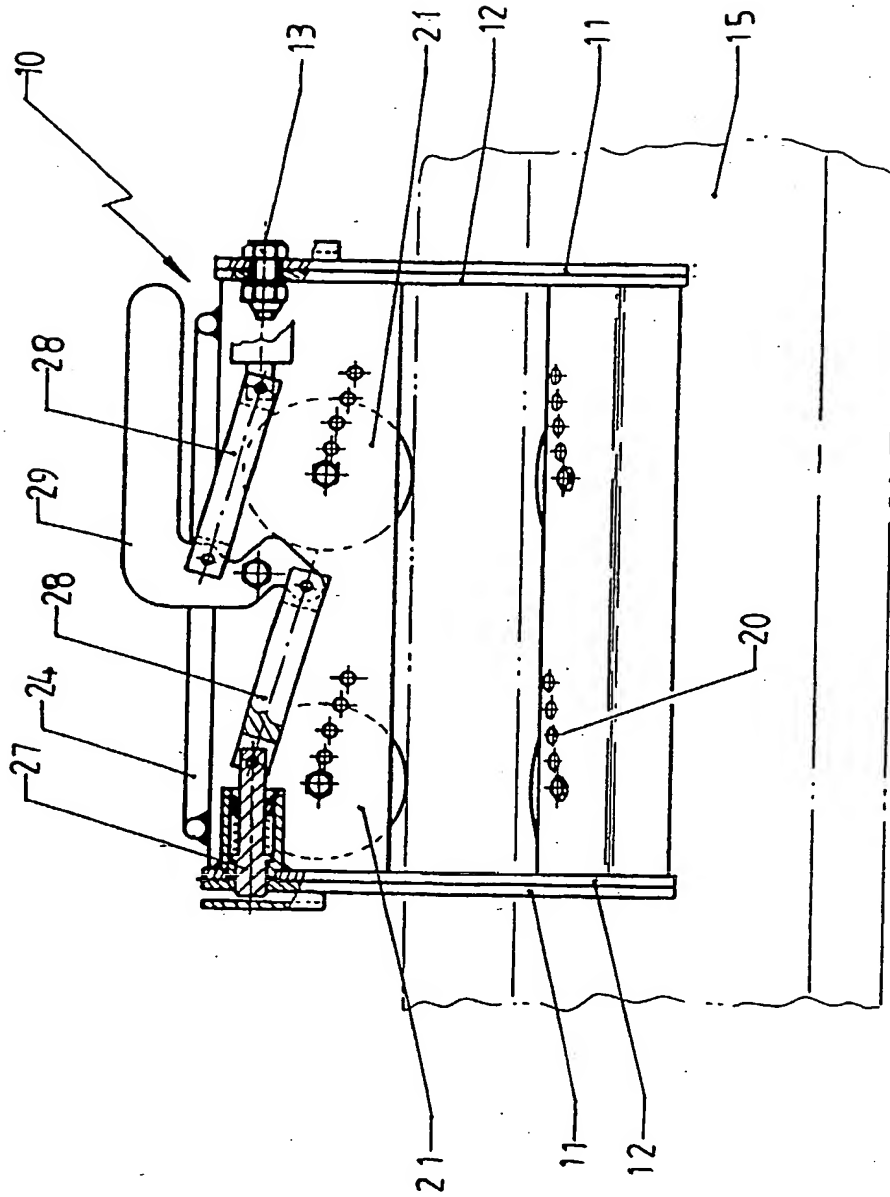


FIG. 4

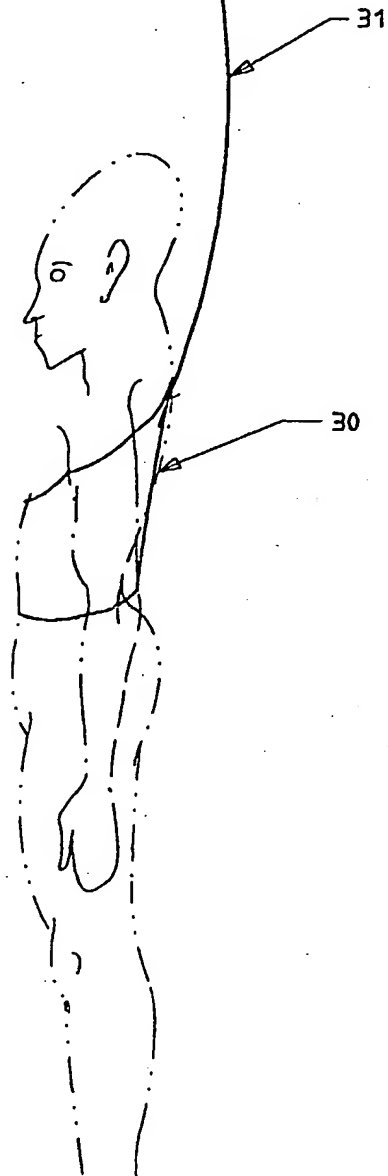
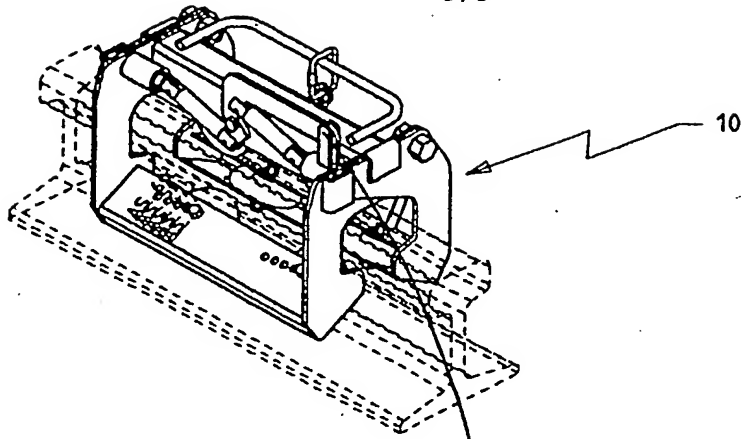


FIG.5

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